

THE TREATMENT OF CONJUNCTIVITIS.

BY A. FREELAND FERGUS, M.D.

IT is my intention in this communication to compare the modes of treatment of conjunctivitis in vogue when as a student I entered the Glasgow Eye Infirmary over a quarter of a century ago, with those which I think, in view of modern pathological teachings, should now obtain.

My first appointment to the staff of that hospital was in the year 1883, and ever since that time I have been in active contact with the large mass of clinical material which is to be found there. I should like to sum up a few of the changes which have come over the scene during the twenty-two years that have elapsed since then. At that period the Scottish ophthalmic world in general, and the Glasgow Eye Infirmary in a very special manner, were still dominated by the teaching of Mackenzie—a man who in his day and generation was a giant. His book is rightly regarded as one of the classics of ophthalmic literature, and shows him to have been one of the greatest clinicians which Scotland has produced in recent times. Mackenzie died in 1868, just eleven years prior to my entering as a student the hospital which he helped to found. His clinical descriptions will likely remain of value for all time, and although modern pathology has in ophthalmic work, as in every other department of medicine, almost entirely changed our point of view, still we must ever speak with reverence of one of the great masters of a bygone age.

A circumstance which early aroused my attention was the comparative frequency with which the simple operation for cataract was followed by suppuration. I had the advantage of seeing the practice of several surgeons of excellent ability, and although the actual figures are not available, it is probably an underestimate of the fact rather than an overstatement to say that suppuration followed in 8 per cent of the cases so as to involve the loss of the eye. No fault could be found with the manner in which the operations had been performed: disastrous results sometimes occurred even after the easiest and

best extractions. Can anything be more distressing to a surgeon who has used every precaution of which he is capable than to find a case going thoroughly wrong? The situation seemed to be all the more terrible because at that time it appeared to be inexplicable. Here were a number of well-performed operations which failed, and no amount of foresight availed to avert the catastrophe. Probably at that time the results obtained at the Glasgow Eye Infirmary were very similar to those of other ophthalmic hospitals.

Another circumstance which early attracted my attention must here be mentioned. Shortly after my appointment to the staff, on one afternoon there came to the dispensary several cases of what appeared to be acute catarrhal conjunctivitis, the remarkable thing about them being that they all came from the same tenement in the High Street. On further enquiry it turned out that a large number of persons in that locality were similarly affected. Here, then, on a small scale was a state of matters closely resembling an epidemic. It was well known at that time that such forms of conjunctivitis as trachoma and gonorrhœal ophthalmia were highly contagious, but it was not then generally realised that some of the most common forms of conjunctival inflammation were extremely infectious. A few years later Dr. Weeks, of New York, discovered the bacillus which goes by his name, and thus gave the explanation of such occurrences. Weeks' discovery at once attracted attention to the bacteriology of the conjunctiva, and the question naturally arose—What light would bacteriological examination of the conjunctiva throw on the occurrence of suppuration after cataract extraction? Could we with the help of the pathologist foresee what cases were dangerous and what were not? Thus the importance, from a practical and clinical point of view, of the modern science of bacteriology suddenly emerged. About the year 1895 the idea was put to the test, the bacteriologist being called in to help to investigate the many problems which seemed to press for solution, and ever since that time regular observations have been made on the cases attending the hospital.

At first these were confined only to the patients on whom it was proposed to operate, but of recent years as a matter of routine an examination is made of all the patients who enter the dispensary with conjunctival ailments. The oil immersion lens has come to play a part as essential in the diagnosis of conjunctivitis as the ophthalmoscope in the examination of the fundus oculi. In the modern ophthalmic clinics the one instrument is just as essential for diagnosis as is the other.

Shortly after these early observations were begun one case alone showed that they were likely to be of considerable service.

A patient came who had already undergone an operation for senile cataract. One eye had been done, but, unfortunately, acute suppuration set in. A thorough investigation both of the eye which had been operated on and of the other was made by a competent bacteriologist, who reported that in the conjunctival sac on each side he found streptococcus. Yet there was no conjunctivitis present, and had that patient been operated on without such researches being made, the likelihood is that the second eye would have followed precisely the same course as the first. Here, then, was a virulent pyogenic organism found in the conjunctival sac without any manifest or outward sign; the real state of affairs could only have been discovered by the use of the oil immersion lens.

Other instances rapidly followed this first one, till it was quite obvious that bacteriology was likely to prove of the highest clinical value. To some of the other instances reference may be made later in this communication; meantime let that one instance be taken as typical of the rest.

The point which now attracted attention was as to how this parasite was to be removed. At first attempts were made to kill it, and that by two distinctly different lines of treatment. Pledgets of cotton-wool soaked in 1 to 10,000 solution of bichloride of mercury were kept constantly on the eye. At the end of eight days film preparations were again made, and the pathologist reported that the streptococcus was as abundantly present as ever. It was quite obvious that the drug employed had exercised no antiseptic influence of any moment. Nor is this to be wondered at when we consider the fact that immersion in a solution of 1 to 1,000 of bichloride of mercury for so long a period as twenty minutes is not sufficient to kill many of the pathogenic organisms. The result in this particular case was disappointing enough. The next attempt was by nitrate of silver, which was employed in the strength of 10 grains to the ounce of water. For the next eight days it was applied in the orthodox manner, the conjunctiva being first carefully dried and then the drug employed. It certainly produced a very intense inflammation.

The conjunctiva became red and swollen, but unfortunately the parasite flourished as luxuriantly as ever. It was still to be found in considerable quantities. By this time the conjunctiva had become so inflamed that no man in his senses would have attempted operation. It was quite obvious that

the nitrate of silver had made matters considerably worse. As a last resource plain sterilised water was used. The eyelids were everted and the whole conjunctival sac was thoroughly irrigated several times a day. What these so-called remedies did not accomplish this mode of treatment very soon effected. Within a comparatively short time the bacteriologist reported that he no longer found the streptococcus in the films. The parasite obviously had been mechanically removed, and not killed. Here it may be remarked that if the operation for cataract is performed in an absolutely aseptic manner, and on an eye in which bacteriological investigations have shown that no pathogenic micro-organisms are to be found in the conjunctival fluid, then it is all but certain that suppuration will not take place. Under these conditions, with one exception to be presently mentioned, the wound heals quietly and quickly, and in most cases the conjunctiva retains its normal whiteness. The exception referred to consists in this, that sometimes there is a considerable amount of iritis in patients who are rheumatic or gouty, which often causes some anxiety, but almost never the entire loss of vision.

Given the conditions of operation already specified, the operator will never see the old acute plastic iritis, ending in the shrinking and softening of the eyeball, which only too frequently happened in olden days. The modern biological pathologists have put every ophthalmic surgeon under a deep debt of gratitude, for the improvements of recent years have been entirely due to their painstaking researches.

As a rule, it may be said that no operation should be undertaken till the conditions have been investigated by a competent bacteriologist. In an earlier part of this paper a typical case was mentioned. It was only one of several which all taught the same lesson. It is not my intention to repeat the same story at any great length, but let me quote three other instances which all happened at the same time, and which seem to be very instructive. There were three children admitted to the hospital within a few days of each other. In each case there was a perforating wound of the cornea, and in all three the wounding instrument had also ruptured the lens capsule, causing a traumatic cataract. In all of them part of the lens substance escaped into the anterior chamber. Two of them did well, the other did not, although all three were treated in a precisely similar manner, namely, the eye in each case was kept covered by a pledget of cotton-wool soaked in a weak bichloride of mercury solution.

In one case no organisms whatever were to be found in the

conjunctival fluid; in both of the others pneumococci were present. In one the parasite was not abundant, and that eye ultimately recovered. In the third case the parasite was very abundant; irido-cyclitis set in with the formation of a hypopion, and the eye had ultimately to be removed.

Such observations help to throw some light on the treatment of ordinary conjunctivitis. The researches of Weeks, of Axenfeld, of Morax, and of many others have gone far to show that even the ordinary forms of conjunctivitis are for the most part due to micro-organic life. The important point is, therefore, to identify, so far as is possible, the micro-organism which is present, for that largely determines the prognosis of the case, and has a considerable influence on the line of treatment. The natural history of conjunctivitis is, comparatively speaking, a new subject. It is still in its infancy, and, no doubt, there is much yet to reward patient investigations made in the laboratory, which will be of service to those of us who are on the less elevated platform of the clinician. At present, however, it is possible to divide conjunctival micro-organisms into two groups. In the first, we include those which are frequently found on the membrane, but only under special circumstances cause inflammation. The chief members of this class are pneumococcus, staphylococcus aureus, staphylococcus albus, streptococcus. In the second, we place those which are generally believed always to cause an inflammatory attack. To this class belong the gonococcus, the diplo-bacillus of Morax, Weeks' bacillus, the Klebs-Loeffler bacillus, and the diplo-bacillus of Petit. This is not the proper place to enter into a description of these various parasites, nor of the means at our disposal for their identification. A good epitome of the whole subject is to be found in Mr. Bishop Harman's book entitled *The Conjunctiva in Health and Disease*; and Mr. Sidney Stephenson's little text-book entitled *Contagious Ophthalmia*, which was published as one of the Medical Monograph Series, contains a considerable amount of valuable information as regards the methods of research.

In conclusion, I should like to say something as to the practical application of the remarks already made. To begin with, from a diagnostic point of view bacteriological investigation is of importance. Take a case of conjunctivitis; by no other method can we determine in the early stages whether such a case is due to, say, the gonococcus, to the Weeks' bacillus, or to the Morax diplo-bacillus. Yet such a differential diagnosis is of the first importance. If, when such a patient presents

himself, you make a cover-glass preparation, and stain it with methylene blue and find small diplococci, the likelihood is that you are dealing with a case of gonorrhœal ophthalmia—a probability which amounts almost to a certainty if you find that the micro-organisms decolour by Gram's method. You thus early become aware that you are dealing with a disease which will require all your skill and attention if a favourable issue is to be obtained. In the early stages ordinary clinical observation entirely fails to differentiate between the various forms of acute ophthalmia. In a case similar to the one just described, it would be the duty of a surgeon immediately to shut out the healthy eye from all risk of contagion by the application of some such apparatus as a Buller's shield. The sooner, in any case, an accurate diagnosis is made the better for the patient.

But, further, biological research has very largely altered our views as regards the treatment of conjunctivitis, and even of blepharitis. Treatment must be viewed under two aspects. It is either prophylactic or else curative. In general medicine prophylaxis has made enormous strides, with the result that several of the specific fevers are now almost never seen; even tuberculosis has decreased very much since the malady was definitely recognised as infectious. The prophylaxis of conjunctivitis is of great importance, although, fortunately, it does not involve the issues of life and death. It has essentially a twofold aspect. When only one eye of a patient is infected it is necessary to protect the other from contagion, at anyrate in serious forms of conjunctivitis such as gonorrhœal ophthalmia. In the second place, those in attendance on the patient must be warned of their danger and every care taken that the disease does not spread. If one eye only be infected with purulent ophthalmia the other must at once be occluded either by a Buller's shield or by gauze, the outer layer of which is securely fastened down by means of collodion. When in a household one child has got a severe conjunctivitis, obviously it should not be allowed to use the same towels as are common to it and to the other members of the household. It ought not to be allowed to wash at a basin which is used by others, but should invariably perform its ablutions at a running tap.

As regards actual treatment, or at anyrate that part of it which consists in the prescription of remedies, it seems to me that little if any progress has been made. Till a few years ago great importance was placed upon the ingredients contained in the lotion or drops which were prescribed for a patient.

The method in which the lotion was to be applied was considered to be of only minor importance. Nothing could better illustrate that view of the case than the directions drawn up by so eminent a man as Mackenzie for the use of his well-known lotion. To his mind it mattered greatly that the eye was bathed with a solution of a mercuric salt, but he did not find it at all incompatible with his ideas of prescribing to order the patient to bathe his or her eyes with a mixture of the lotion and the discharges removed from the conjunctiva at previous washings. Even within recent years Mackenzie's prescriptions have been re-issued, and it is almost incredible to us that his old directions appear in the new edition of his prescriptions. Many of these remedies which were so much in vogue in the year 1879 have fallen into disuse, and new ones have taken their place. The question is, are these new preparations of greater utility than those which they have supplanted, or does the whole method of conjunctival treatment require revision? I am at present of the latter opinion. A few years ago somebody invented protargol, an organic preparation of silver. It was announced as being marvellously efficacious, infinitely better than the nitrate, for the surgeon could use it without producing argyrosis. It was altogether to revolutionise ocular therapeutics. A few months showed how unfounded were such hopes, for the salt produced argyrosis quite as markedly as silver nitrate, and its great potency in curing disease may well be doubted when a few months later it was found necessary to invent another drug, this time known by the name of argyrol. Still more recently other drugs have been announced as possessing most wonderful properties. The momentous question arises, have they the efficacy which their advocates claim? Here let it be noted that most of the literature written by authors who are strongly in their favour contains almost no account of biological researches. One author, who has written very confidently about their superiority, has never in his clinic made a film preparation so as to enable him to investigate his cases. The evidence, so far as I have been able to weigh it, is entirely negative. To my mind, proof is still wanting that these new remedies are of much assistance in the treatment of conjunctivitis. So far as proofs are available they entirely confirm the views just enunciated, and attention may be called to four distinct lines of argument.

1. Most cases of conjunctivitis heal of their own accord, just as do the specific fevers. In days gone by it was the practice of some physicians to administer small doses of belladonna to

patients who were afflicted with scarlatina. No doubt a due proportion of such patients recovered. Would anyone at present attribute their recovery to the infinitesimal doses of belladonna which had been administered? Such cases as, say, the conjunctivitis of Weeks will recover after they have run their course if simply left alone and kept clean. Take such a case. You put into the conjunctival sac a few drops of a solution of protargol and the patient gets better. You are not entitled to regard this as cause and effect, unless you are prepared when a patient with a Weeks' conjunctivitis, who is under one of these new remedies, is found on a subsequent visit to the hospital to have developed a corneal ulcer, to attribute this ulceration to the remedy employed.

2. The agar-agar or serum-agar tubes, with the cultivations of the various micro-organisms, afford a tolerably reliable test as to the value of certain remedies. Again and again the colonies growing in these tubes have been for considerable periods immersed in a 15 per cent solution of protargol, and that without doing them the slightest harm. Mr. Harman points out, and probably truly, that as protargol is a colloid, its powers of penetration are likely to be very small. Quite recently Dr. Fortescue Brickdale wrote an interesting letter to the *British Medical Journal*, in which he said—"As to argyrol, I cannot speak definitely; but some years ago I investigated the bactericidal properties of collargol, and published the results in the *British Medico-Chirurgical Journal* for 1903. My laboratory experiments led to the same conclusion as those of Dr. Marshall and Dr. Macleod Neave—namely, that the bactericidal action of collargol is practically *nil*. I therefore investigated the clinical literature and was able to collect accounts of 44 cases. From a critical review of these cases I came to the conclusion that in cases proved to be septicæmia and pyæmia in man collargol had no effect, and that in toxæmic cases the effect was mainly seen in a fall of temperature very similar to that produced by hydrotherapy and certain antipyretic drugs."

3. My own clinical experience has by no means given me the favourable results of which other men speak. I confess I have found the drugs of little service, and they have had a thorough and extensive trial in my hands. Here, for example, is a striking case. A gentleman came with senile cataract in each eye, and also with an inflamed conjunctiva. It was quite impossible to operate on the eyes in the condition which they presented at his first consultation. The matter was delayed for a month, and meantime he was seen every day by his own

doctor, who applied a solution of protargol regularly and systematically. By the end of the month the conjunctiva had become considerably more inflamed, and the parasite to which the inflammation was due was much more abundant than it had been at his previous visit. The condition was certainly worse instead of better. What really put that man right was to give up all so-called astringent remedies and to irrigate him thoroughly three or four times a day with a pint of tepid normal saline. A tolerably extensive experience has shown that the best method by which to overcome a pure inflammation of the conjunctiva is saline irrigation.

4. Other surgeons have also had disappointing results. Scarcely a week passes but patients come with notes from medical men giving details of the treatment of conjunctivitis, both with the older remedies and with those now so much in vogue. Generally such communications wind up with an expression of great disappointment at the result. Recently a case came under notice in which collargol drops had been used for a period of six months. In such circumstances, one does not know whether to admire the more the faith of the physician or the patience of the sufferer. So competent an authority as Mr. Harman has little to say in favour of the new remedies. Within the last year I have seen a large number of cases in connection with the Workmen's Compensation Act, and in a considerable proportion of these one of the eyes had, in consequence of injury, been removed. Not infrequently the socket was found in a state of chronic suppuration, and that many months after the enucleation. It seems to me that if these drugs really had the value which some of their advocates claim for them, such a state of matters should have been put right within a few days; for in the histories of most of them, mention was made of the extensive use either of protargol or of argyrol.

